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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/605,160	09/12/2003	WEN-PIN CHIU	11439-US-PA	2159
31561 7590 06/18/2007 JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE 7 FLOOR-1, NO. 100 ROOSEVELT ROAD, SECTION 2 TAIPEI, 100 TAIWAN			EXAMINER MCDONALD, RODNEY GLENN	
			ART UNIT 1753	PAPER NUMBER
			NOTIFICATION DATE 06/18/2007	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USA@JCIPGROUP.COM.TW

<b>Office Action Summary</b>	<b>Application No.</b> 10/605,160	<b>Applicant(s)</b> CHIU, WEN-PIN	
	<b>Examiner</b> Rodney G. McDonald	<b>Art Unit</b> 1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 May 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 7-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 7-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 16, 2007 has been entered.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 7, 10, 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim (U.S. Pat. 5,840,167) in view of Katsuki et al. (U.S. Pat. 5,728,276) and Ito et al. (U.S. Pat. 5,354,445)

Regarding claims 7, 11, Kim teaches an ionized physical vapor deposition process comprising providing a plasma reaction chamber having a target (32) and a wafer pedestal (illustrate schematically) supporting a wafer (60) in the chamber. An ionization unit (51) is set up between the metallic Al target (32) and the wafer pedestal and a conductive electrodes (54, 55) set up between the ionization unit and the wafer pedestal. (See Fig. 3; Column 2 lines 64-68; Column 3 lines 1-8) A wafer (60) is place

on the pedestal. (Column 3 lines 8) A negative bias voltage is applied to the target (32) and a negative bias is applied to the electrode (54), wherein the negative bias voltage applied to the target produces and accelerates ionized metallic atoms, and the electrode (54) decelerates the ionized metallic atoms right before reaching the wafer surface (60). (See Fig. 3; Column 4 lines 21-55)

Regarding claim 12, Kim the ionized metallic atoms accelerate at a second rate through the conductive electrode due to the negative voltage applied to the conductive electrode. The second rate would be less than the first acceleration rate because the negative voltage of the electrode would decelerate the positive metallic atoms. A metallic thin film is formed. (Column 4 lines 21-55)

The differences between Kim and the present claims is that the negative bias voltage to the target being smaller than the negative bias voltage applied to the decelerating electrode is not discussed (Claim 7), the decelerating electrode being in the form of a mesh is not discussed (Claims 7, 11) and the use of a reactive gas is not discussed (Claims 10, 13).

Regarding the negative bias voltage to the target being smaller than the negative bias voltage applied to the decelerating electrode (Claim 7), Katsuki et al. teach providing a target with a DC voltage of -700 V. (Column 6 lines 25-27) The bias to the mesh can be a voltage of -30 V. (Column 6 lines 18-22)

The motivation for applying a lower negative voltage to the mesh than to the target is that it allows for control of layer thickness. (Column 2 lines 42-47)

Regarding the decelerating electrode being in the form of a mesh (Claims 7, 11), Ito et al. teach placing an electrode closer to the substrate so that ionized clusters can be accelerated or decelerated by selection of the appropriate electrode potential. The electrode structure can be disc shaped but alternative shapes can be used in place of the disc shape including mesh type electrodes, bar type electrodes or the like. (Column 13 lines 22-34)

The motivation for utilizing a grid electrode is that allows for controlling the speed of ionized particles. (Column 13 lines 22-34)

Regarding claims 10, 13, Katsuki et al. teach utilizing a reactive gas. (Column 5 lines 51-55)

The motivation for utilizing a reactive gas is that it allows depositing a reactive thin film. (Column 5 lines 51-55)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Kim by utilizing the features Katsuki et al. and Ito et al. because it allows for controlling the layer thickness and depositing a reactive thin film.

Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim in view of Katsuki et al. and Ito et al. as applied to claims 7, 10, 11-13 above, and further in view of Givens et al. (U.S. Pat. 5,807,467).

The differences not yet discussed is that initially depositing a thin film over the wafer without applying any bias to the mesh and then applying a negative bias voltage

to the mesh while forming a thin film (Claim 8) and wherein the film layer has a thickness between 20% to 30% of the ultimate thickness of the thin film (Claim 9).

Regarding claim 8, Givens et al. teach depositing a layer 16 by sputtering and then sputter depositing a layer 18 by utilizing a bias to a collimator in order to reduce cusping at the corners. (Column 2 lines 26-44; Column 8 lines 65-68; Column 9 lines 1-7; Column 9 lines 24-36)

Regarding claim 9, in Fig 6 it appears that layer 16 is 20% to 30% of the thickness of layer 18. (See Fig. 6)

The motivation for utilizing the features of Givens et al. is that it allows for preventing cusping. (Column 9 lines 5-7)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Givens et al. because it allows for preventing cusping.

**REMARKS:**

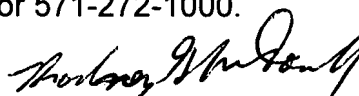
In response to the argument that the prior art does not teach decelerating ionized atoms right before reaching the substrate, it is argued that newly cited reference to Kim teach at Column 4 lines 50-52 and Column 3 lines 5-8 applying a negative potential applied to electrode 54 for decelerating ions right before reaching the wafer surface. (See Fig. 3; Column 4 lines 50-52; Column 3 lines 5-8)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M-TH with every Friday off..

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Rodney G. McDonald  
Primary Examiner  
Art Unit 1753

RM  
June 7, 2007